Project Management

18ME653(PE)/18ME761-OE

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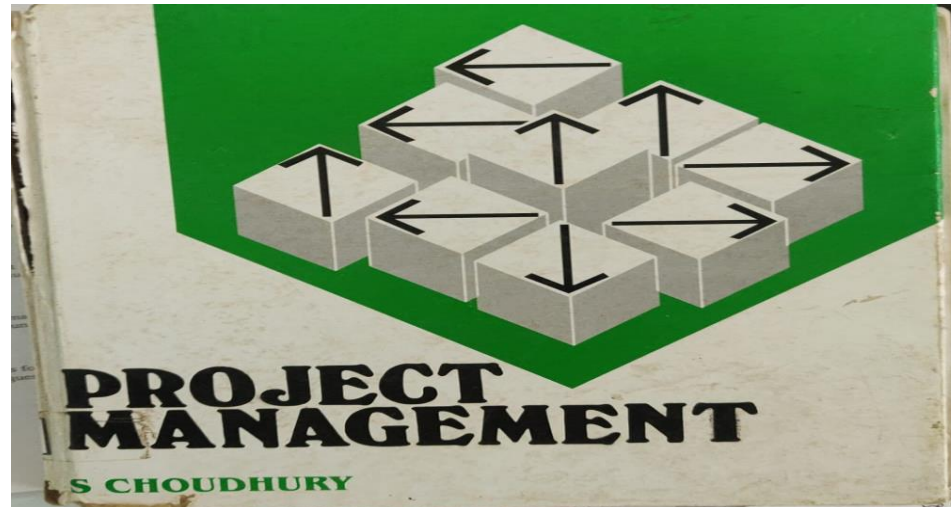*Department of Mechanical Engineering*

Books

1. **S Choudhary, "Project Management" Tata McGraw Hill Education Private Limited New Delhi.**

2001

2. Harold Kerzner, "Project Management: A Systems Approach To Planning, Scheduling And Controlling ", CBS publisher and distributers

3. L S Srinath " PERT and CPM Principles and Applications" Third Eddition

4. Dr. P N Modi "PERT and CPM"

Course learning objectives

1. Understand Basic concepts of project management and project life cycle.

2. Understand method of project preparation and cost estimation.

3. Apply the appropriate project management tools and techniques.

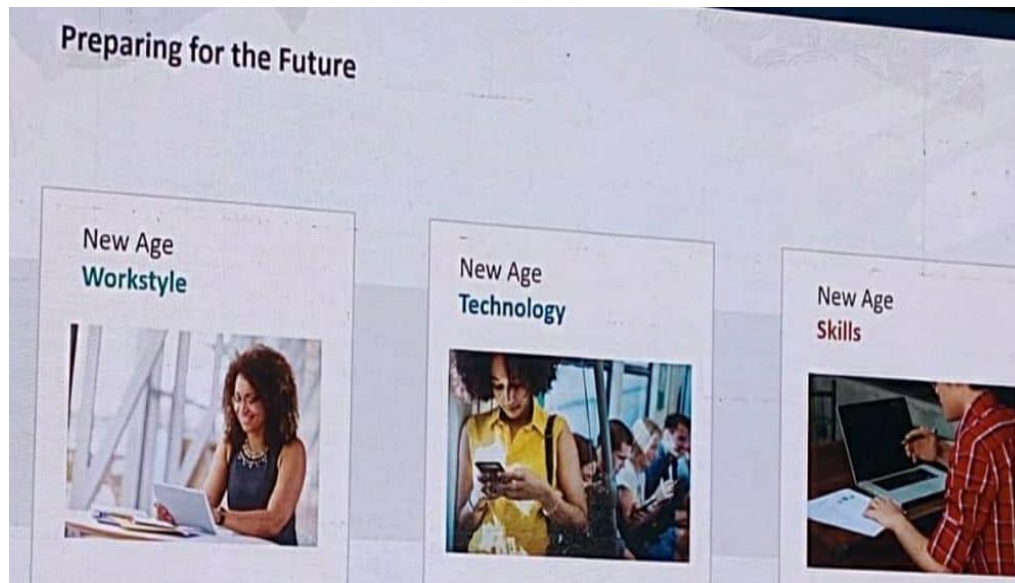4. Understand Project coordination and control

Five Key Skills Required for Industry 4.0

- Digital Skills
- Technology and computer skill
- Programming Skills for Robots and automation
- Critical Thinking
- Working with tools and techniques

Deloitte: Growth Engine Machinery Sector Four scenarios for a successful future in 2030

- With 88 million project-oriented roles to be filled by 2027— that's 2.2 million project manager roles every year, it's just the right time to skill up in project management

Preparing for the Future

New Age **Workstyle**

New Age **Technology**

New Age **Skills**

MANAGEMENT

Manage - Men – T

Project

Several Economists & Bankers have defined a Project in different ways. Let us also examine a few other definitions of **"Project."**

- Project is an approval for a capital investment to develop facilities to provide Goods & Services. -- **World Bank**

- Project is non-repetitive, one – off undertaking normally with discrete times, financial and technical performance goals. **– Harrison**

- A Project typically has distant mission that it is designated to achieve and clear termination point, the achievement of the mission. – **Newman, Summer**

- A Project is a whole complex of activities involved in using resources to gain benefits. **-- Gillinger**

- A Project can be defined as a Scientifically evolved work plan devised to achieve a specific objective within a specified period of time **--- Vasanth Desa**i

Project Management

Figure 1–2. Overview of project management.

- The project management is designed to manage or control the company resources on given activity within time, within cost, and performance.

- Time , cost and performance are the constraints on project.

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Unit 1: Concepts of project,

Categories of projects,

Characteristics of project

Phases of project life cycle,

Roles and responsibilities of project leader,

Tools and Techniques of project management

Self leering topic: Project management as profession

Categories of projects

TYPES OF PROJECTS
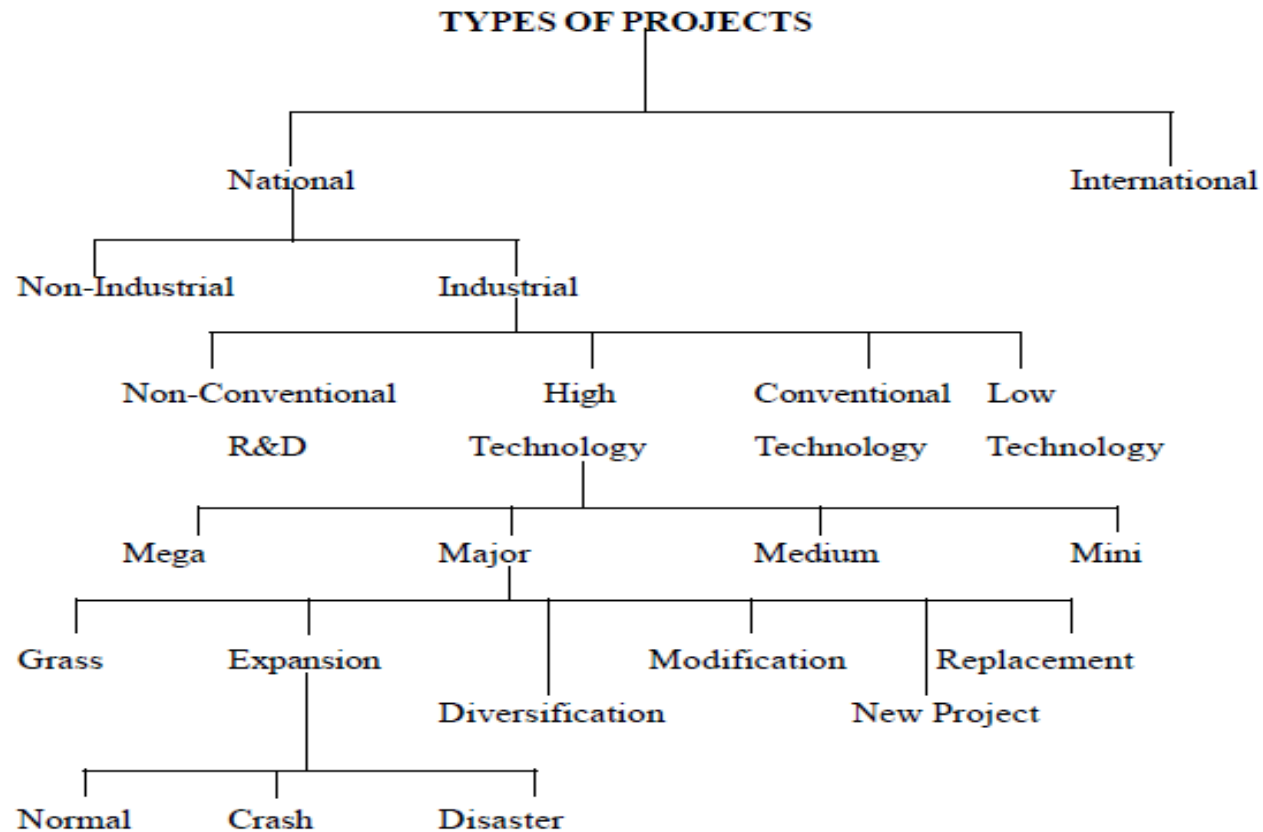
Fig. 1.2 Classification of Project

Make in India
Health cards
Swachh Bhart
 Smart City
Pradhan Mantri gram sadak yogana
Skill India
Project farmers
Demonetization in India
National mission of clean Ganga
Project Tiger
Digital India
Web development projects
4G to 5G
Land records digitization
Digital universities
Skill India
Metro

Next Gen students are more focused on **"innovating new ways with simple to adopt approach"** and are contributing to this global mission.

Karnataka has signed a Rs. 23,000 crore MoU to set up India's first semiconductor fab!

LUSAIL STADIUM FOR FIFA WORLD CUP 2022

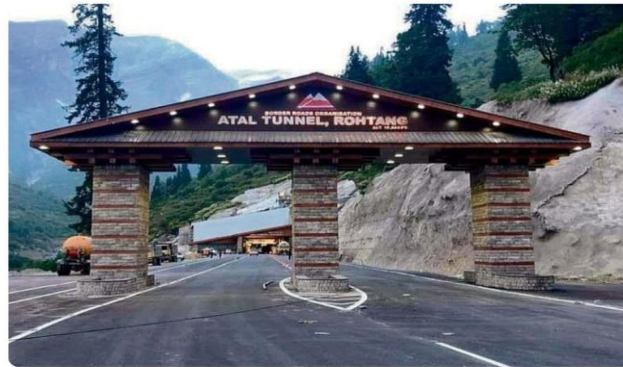David Beckham

Victoria Cross Tower

Contractor: Lendlease

Location: Sydney, Australia

Cost: $1.2 billion

Courtesy of Lendlease

On April 28, 2022, the Border Roads Organisation (BRO) Engineering Marvel Atal Tunnel in Rohtang, Himachal Pradesh, got the Indian Building Congress (IBC) 'Best Infrastructure Project' award in New Delhi.

Characteristics of a Project :

1. Objectives   11. High level of sub-contracting

2. Life span   12. Risk and uncertainty

3. Single entity

4. Team work

5. Life cycle – growth – maturity – decay.

6. Uniqueness

7. Change

8. Successive principle

9. Made to order

10. Unity in diversity

<u>Project Life Cycle Phases</u> :

All projects have to pass through fallowing phases:

1. Conception Phase

2. Definition Phase

3. Planning and organizing

4. Implementation

5. Project clean-up

1. **Conception phase :**

➢ Project idea germinates

➢ One is seriously trying to overcome certain problems.

➢ Problems are non utilization of funds, plant capacity, expertise

➢ One is seized with problems he starts looking around to find out solution.

➢ The idea may suddenly come to his mind

Whatever may be the source the idea need to be put in black and white.

2. Definition Phase

The areas to be examined during definition phase for **cement plant** are

1. Raw materials
2. Plant size/capacity
3. Location and site
4. Technology or process selection
5. Project layout
6. Plant and machinery
7. Electrical and instrumentation works
8. Civil engg. works
9. Utilities – Fuel ,power, and water
10. Manpower and organizational pattern
11. Financial analysis

3. Planning and organizing.

This phase starts with <u>Preparation of Project Execution plan</u>

1. Project infrastructure

2. System design and basic engineering package

3. Organisation and manpower

4. Schedules and budgets

5. Licencing and government clearances

6. Finance

7. Systems and procedures

8. Identification of project manager

9. Design basis and general conditions for purchase and contracts

10. Site preparation and investigations

11. Construction resource and and materials 12. Work packing
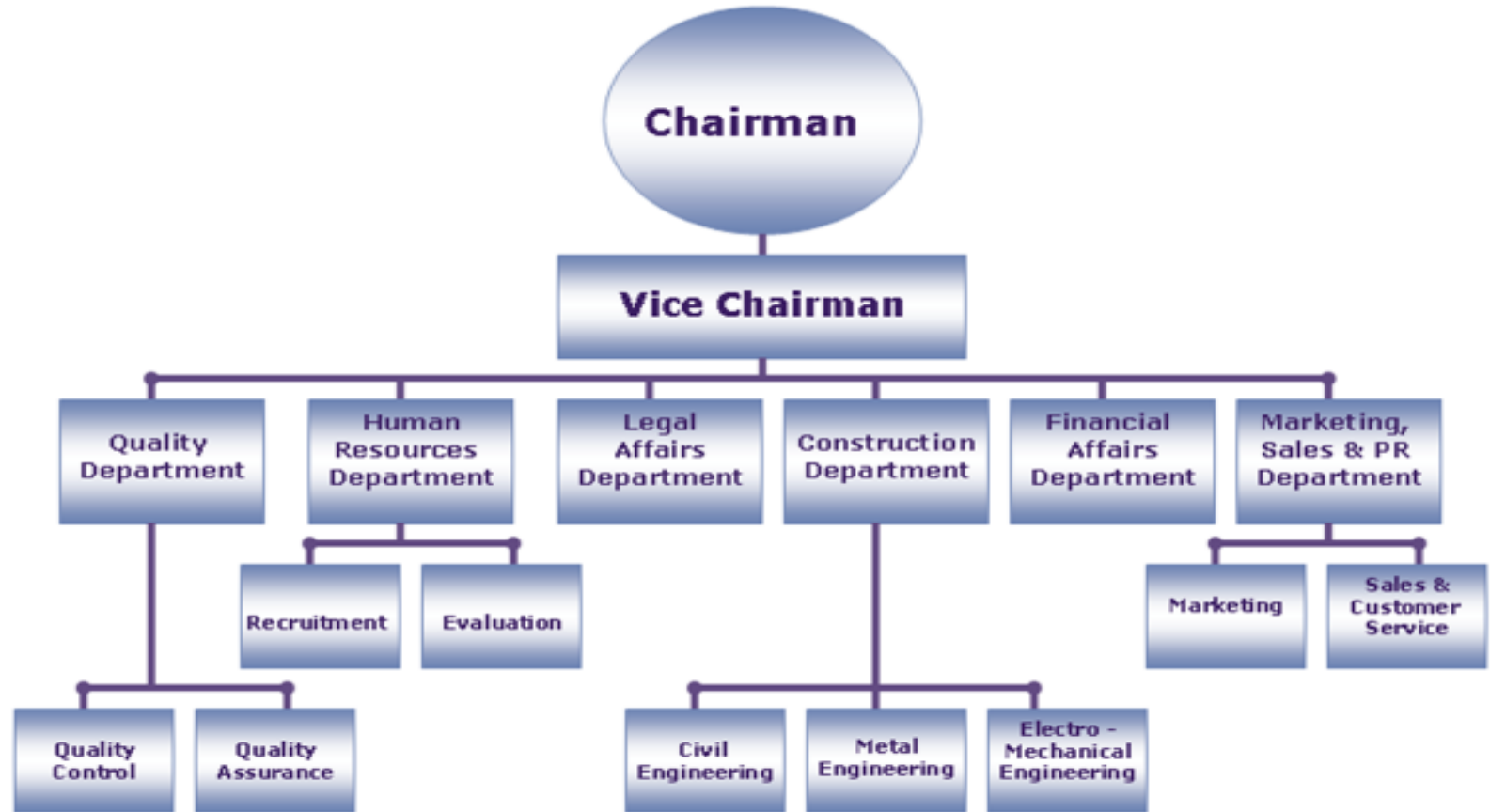
4. Implementation phase

80 -85 % work is completed
This period is hectic activity of project

SUB PHASE NO	SUB-PHASE DESCRIPTION	MONTHS											
		1	2	3	4	5	6	7	8	9	10	11	12
I	DETAILED ENGINEERING	▬	▬	▬	▬	▬	▬	▬	▬				
II	ORDERING		▬	▬	▬	▬	▬						
III	DELIVERY								▬	▬	▬		
IV	CONSTRUCTION & ERECTION					▬	▬	▬	▬	▬	▬	▬	
V	START-UP											▬	▬

FIG. 1.3 Sub-phases of project implementation for an engineering project

5. Project clean-up

1. Planning of staff and execution of project

2. Project accounts are closed

3. Design engineers are posted on field

Project life cycle curve
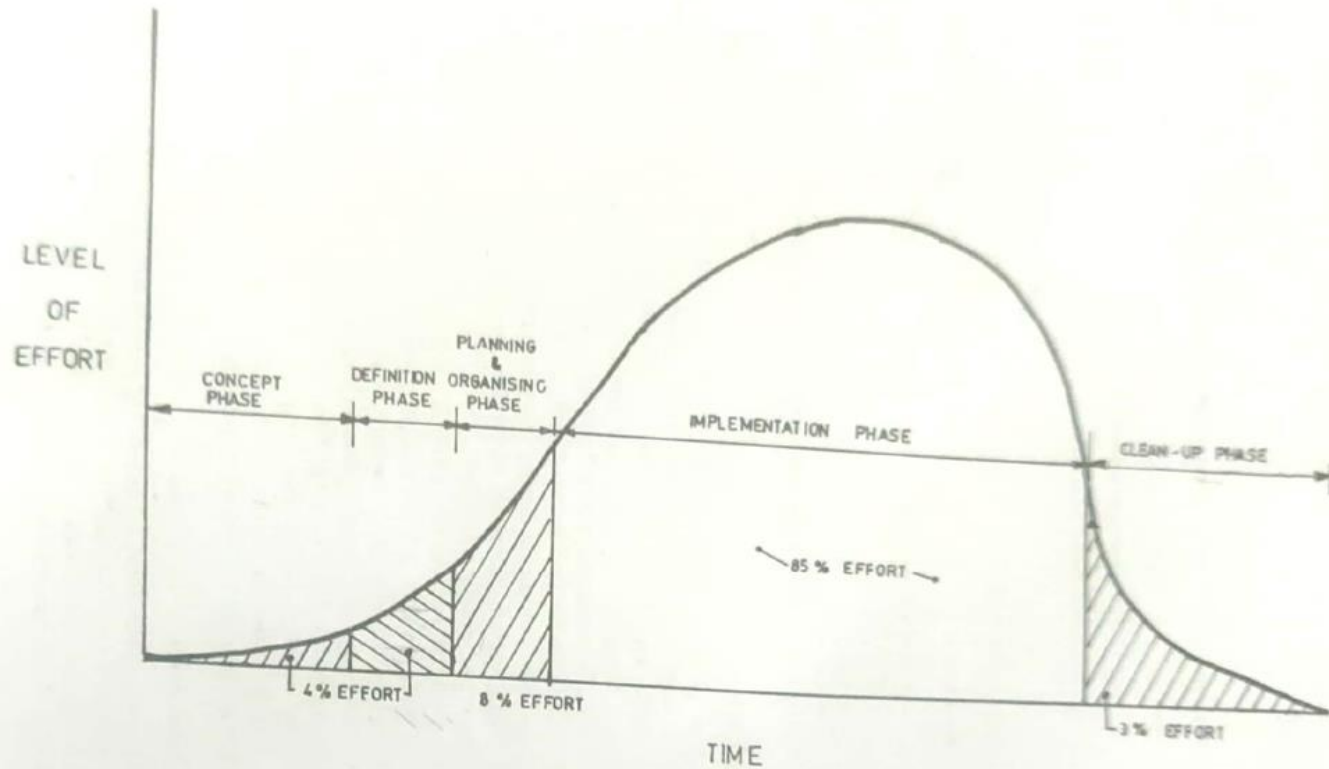
FIG. 1.4 Project life cycle curve

Case study

Improving Capability with Project Management Certifications: Telstra's Story

Telstra has approximately 33,000 employees in over 20 countries and offers a wide range of services around the globe, with a focus on the Asia-Pacific region. telstra.com.au.

➢ 3.2 billion people, almost half the globe's population, use the underline internet, according to and from International. Telecommunication Union

Vision of Telstra

- **"Our vision of becoming a world-class technology company won't be achieved without world- class project management. It's central to the way we work, and fundamental to our ability to deliver a brilliant, connected future for our customers."** Andrew Penn, CEO, Telstra

- **That's why its strategic goal is to create a brilliant, connected future for everyone.**

- Project Management Institute (PMI)

- It frameworks, standards, and <u>certifications</u> to cultivate talent, standardize qualifications across its Global Services Practices (GSP) division, and support career paths for its project managers.

Focusing on Customer Delivery

➢ The GSP (Global Service practice)division, which is overseen by Telstra's Global Project Management Services .

➢ Delivers high- end technology consulting, design, and deployment across all of Telstra's technology offerings.

➢ Established in 2013, GSP's major product portfolios include network services, communications and collaboration technologies, and security and cloud services.

➢ only in two years, the number of employees grew to more than 1,500. Every day, GSP manages an average of 2,000 unique customers

➢ which range from "everyday" projects to multi-million dollar transition and transformation projects.

High-Performing Organizations Focus on Talent Management

PMI's *Pulse of the Profession®: Capturing the Value of Project Management* report indicates that high-performing organizations are significantly more likely to focus on talent management, on establishing ongoing training, and on formal and effective knowledge transfer.

In fact, that research shows that 80 percent of high-performing organizations had ongoing training for project managers, 65 percent had a formal process in place to develop project manager competency, and 62 percent had defined career paths for their project managers.

	High performers	Low performers
Ongoing training for project managers	80%	51%
Formal process to develop project manager competency	65%	36%
Formal knowledge transfer process	75%	35%
Defined career path for project managers	62%	33%
Highly effective knowledge transfer process	32%	6%
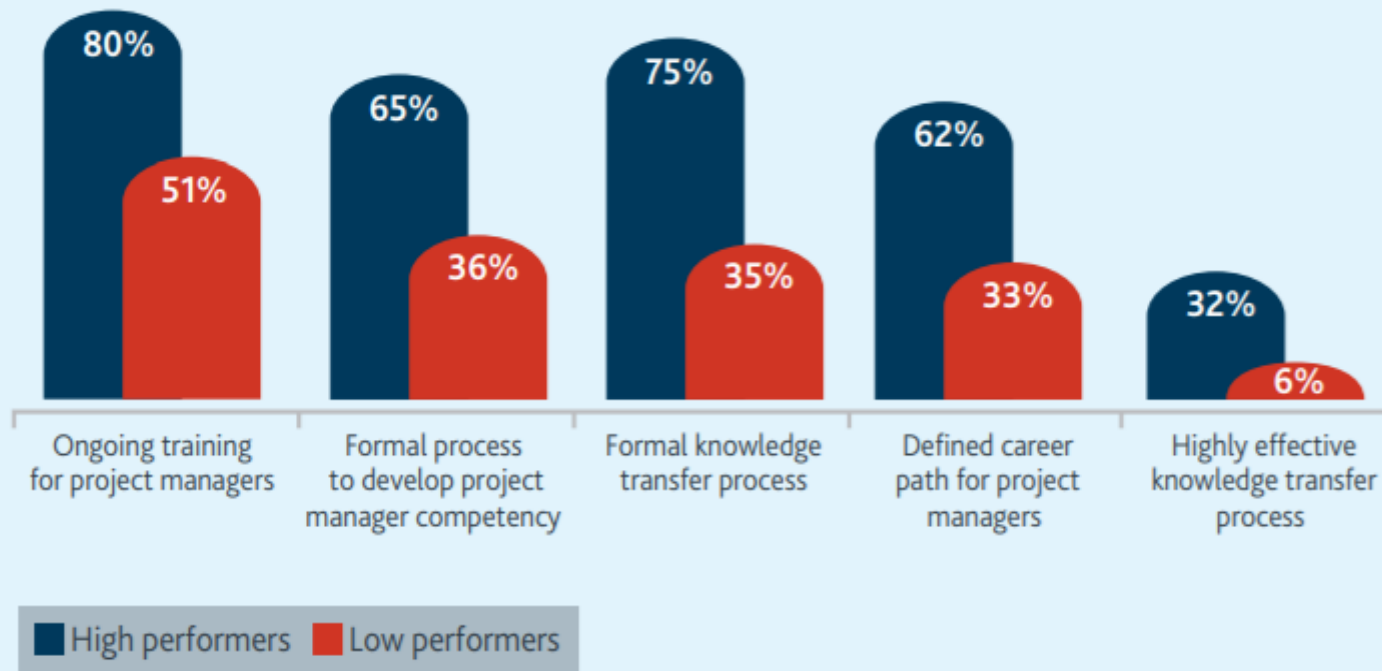
The Need for Strategy

➢ Careful development and management of project managers can contribute greatly to an organization's success

➢ Telstra needed a certification model that would provide confidence for its customers and ensure that projects would be delivered in a consistent, reliable, world-class manner.

➢ **Telstra was establish a formal certification program for its project management community.**

A Corporate-Wide Initiative

➢ **In mid-2015, Telstra launched a program to certify more than** 400 of GSP's project managers through PMI's globally recognized certifications.

➢ **Now, Telstra has a model that can be scaled domestically and globally.**
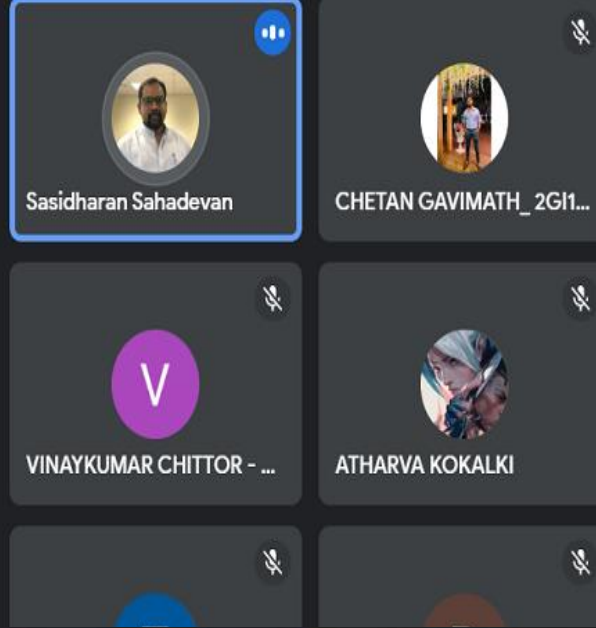
Software for Project Management

1. Primavera P6
2. MSP (Microsoft Project)
3. BIM 360

Additional Certification

1. PMP
2. CPM
3. Prince2
4. CFM

	Initiating	Planning	Executing	Monitoring and Control	Closing
Project Integration Management	Develop Project Charter	Develop Project Management Plan	Direct & Manage Project Execution	1. Monitor & Control Project Work 2. Perform Integrated Change Control	Close Project or Phase
Project Scope Management		1. Plan Scope Management 2. Collect requirements 3. Define Scope 4. Create WBS		1. Validate Scope 2. Control Scope	
Project Time Management		1. Plan Schedule Management 2. Define Activities 3. Sequence Activities 4. Estimate Activity Resources 5. Estimate Activity Durations 6. Develop Schedule		Control Schedule	
Project Cost Management		1. Plan Cost Management 2. Estimate Costs 3. Determine Budget		Control Costs	
Project Quality Management		Plan Quality Management	Perform Quality Assurance	Control Quality	
Project HR Management		Plan Human Resources	1. Acquire Project Team 2. Develop Project Team 3. Manage Project Team		
Project Communications Management		Plan Communications Management	Manage Communications	Control Communications	
Project Risk Management		1. Plan Risk Management 2. Identify Risks 3. Perform Qualitative Risk Analysis 4. Perform Qualitative Risk Analysis 5. Plan Risk Responses		Control Risks	
Project Procurement Management		Plan Procurement Management	Conduct Procurements	Control Procurements	Close Procurements
Project Stakeholders Management	Identify Stakeholders	Plan Stake Holders Management	Manage Stakeholder Engagement	Control Stakeholder Engagement	

NPTEL courses

1) Project Management for Managers

2) Project Management

3) Software project management etc

➢ **NPTEL** was initiated in 2003 by seven IITs (Bombay, Delhi, Kanpur, Kharagpur, Madras, Guwahati and Roorkee) along with the Indian Institute of Science (IISc), Bengaluru

➢ In its first phase (2003-2009), **NPTEL** developed 235 courses in web/video format, at http://**nptel**.iitm.ac.in (now defunct).

Solar Park

India's first solar park at Charanka village in Gujarat then

Dhirubhai Ambani Solar Park near Pokran in the Jaisalmer are two major solar power projects in India.

Gujarat Solar Park known as Charanka Solar Park is Asia's largest solar park hub.

Case study

- Mukesh Ambani sets out to change the face of Indian cities, first project already on
  - For study

## 1.10 TOOLS AND TECHNIQUES FOR PROJECT MANAGEMENT

There are several tools and techniques which would contribute significantly towards effective project management these can be broadly grouped under the following heads :

1. **Project selection techniques**
   (a) Cost benefit analysis and
   (b) Risk and sensitivity analysis

2. **Project execution planning techniques**
   (a) Work breakdown structure (WBS)
   (b) project execution plan (PEP)
   (c) Project responsibility matrix and
   (d) Project management manual

3. **Project scheduling and coordinating techniques**
   (a) Bar charts
   (b) Life cycle curves
   (c) Line of balance (LOB) and
   (d) Networking techniques (PERT/CPM)

4. **Project monitoring and progressing techniques**
   (a) Progress measurement technique (PROMPT)
   (b) Performance monitoring technique (PERMIT) and
   (c) Updating, reviewing and reporting technique (URT)

5. **Project cost and productivity control techniques**
   (a) Productivity budgeting techniques
   (b) Value engineering (VE) and

Tools and Techniques of project Management

6. **Project communication and clean-up techniques**

   (a) Control room and

   (b) Computerised information systems

Roles and Responsibilities of project Manager

FIG. 1.11 Execution arrangement: responsibility of a project manager

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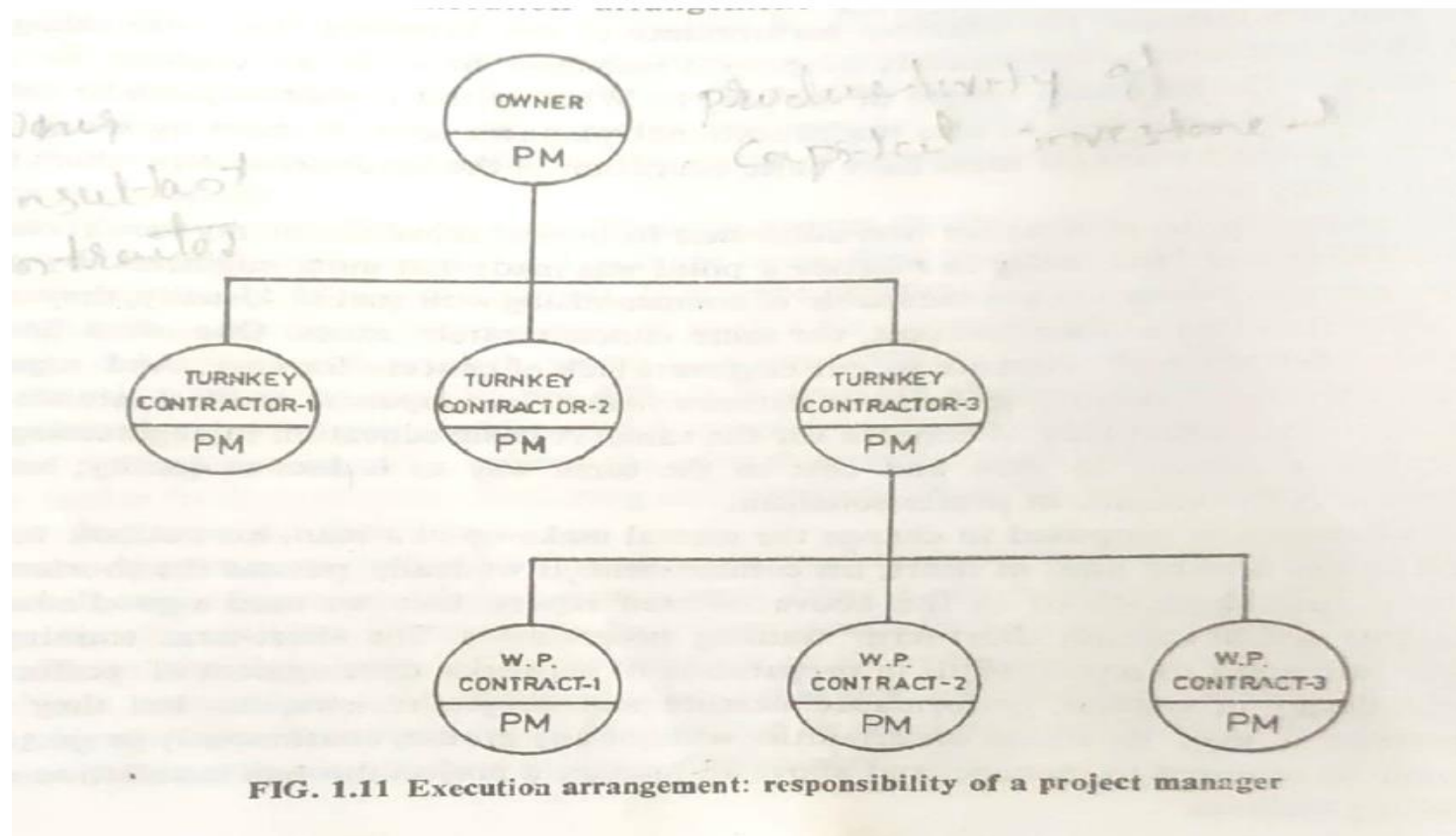
Roles and Responsibilities of project Manager(General management capabilities)

1   Defining and maintaining the integrity of a project;

2   Development of project execution plan;

3   Organization for execution of the plan;

4   Setting of targets and development of systems and procedures for accomplishment of project objectives and targets;

5   Negotiation for commitments;

6   Direction, coordination and control of project activities;

7   Contract management;

8   Non-human resource management including fiscal matters;

9   Problem-solving;

Roles and Responsibilities of project Manager

10   Man management;

11   Satisfaction of customer, Government and the public; and

12   Achievement of project objectives, cash surplus and higher productivity.

Self learning topic

➢Project Management as profession